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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,805	10/20/2003	Yasunori Sakurabayashi	09227.002-00	2447
22852 7590 12/21/2006 FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413			EXAMINER HENDRICKSON, STUART L	
			ART UNIT 1754	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE			MAIL DATE	DELIVERY MODE
3 MONTHS			12/21/2006	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/687,805

Applicant(s)

SAKURABAYASHI ET AL.

Examiner

Stuart Hendrickson

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1754

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 16-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-9, 11-15 and 20-24 is/are rejected.
- 7) ☒ Claim(s) 4, 5, 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

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The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-3, 6-9, 11-15 and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the English Translation of "Double-wall Carbon Nanotubes derived from Fullerene Arrays generated inside Single-Wall Carbon Nanotubes: Nanometer Scale Test Tube," (hereinafter referred to as the Badow reference).

As to claims 1-3 and 15, Badow teaches creating multi-walled carbon nanotubes from single-walled carbon nanotubes with  $C_{60}$  fullerenes on the inside by application of high-temperatures. Badow also teaches that electron irradiation of single-walled nanotubes containing fullerenes is known to create multi-walled carbon nanotubes. It would have been obvious to one of ordinary skill in the art at the time of this invention to combine the methods of electron irradiation with the application of high temperature because both methods are shown to be effective for producing multi-walled nanotubes and because the high temperature would achieve a more thorough reaction.

As to claims 6 and 11, it would have been obvious to one of ordinary skill to use whatever accelerating voltage is effective for the irradiation step.

As to claim 7, it would have been obvious to one of ordinary skill to use whatever irradiation is necessary for the irradiation step.

As to claims 8 and 12, it would have been obvious to one of ordinary skill to use any electron beam density that would be effective for the irradiation step.

As to claims 9, it would have been obvious to one of ordinary skill in the art to irradiate the hybrid structures for whatever time is necessary.

As to claim 13, it would have been obvious to heat the hybrid for a "specified period" prior to the electron beam irradiation because irradiation is much quicker than regular heating. Therefore, it would be desirable to have the hybrid maintained at a heated state before providing the irradiation so that both the heating state and the electron beam are present.

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As to claim 14, the hybrid structure would inherently remain heated for a specified period after the irradiation because the newly created multi-walled nanotube would retain some of the heat for a specified period.

Claims 22-24 merely recite a mechanism.

Applicant's arguments filed 10/26/06 have been fully considered but they are not persuasive. The rejection discusses a reason for heating in the Bandow process; bonds need to be broken and thus energy is needed and thus heating to assist is obvious. Note also that since heating alone is known and electron irradiation alone is known, then using both together is obvious; In re Kerkhoven 205 USPQ 1069.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication should be directed to examiner Hendrickson at telephone number (571) 272-1351.



Stuart Hendrickson  
examiner Art Unit 1754